IN THE CLAIMS

Please amend the claims as set forth below:

1. (Currently Amended) In a system in which data transmissions on a multi-conductor signal path produce current flow based on the value of the data transmitted, a method of reducing change in current flow between successive data transmissions, the method comprising:

   encoding data values represented by sets of N bits to produce corresponding sets of M symbols, each of the symbols to be transmitted on a respective signal conductor of the multi-conductor signal path and representing a plurality of bits, and each set of M symbols being selected to produce a current flow within a predetermined range of current flows; and

   transmitting the sets of M symbols.

2. (Original) A method as recited in claim 1 wherein each set of M symbols represents more than N bits.

3. (Original) A method as recited in claim 1 further including decoding the data values from the sets of M symbols.

4. (Original) A method as recited in claim 1 wherein each conductor in the multi-conductor signal path supports four different symbols.

5. (Original) A method as recited in claim 1 wherein each symbol represents two bits.

6. (Currently Amended) A method of multi-level signaling, the method comprising:

   determining whether signal current required to transmit a data element is within a predetermined range of current values; ~~and~~

encoding the data element if the current required to transmit the data element is not within the predetermined range of current values, wherein the data element is encoded such that the signal current required to transmit the data element is within the predetermined range of current values; and

adding a signal to the encoded data element to indicate any encoding of the data element.

7. (Canceled) A method as recited in claim 6 further including adding a signal to the encoded data element to indicate any encoding of the data element.

8. (Original) A method as recited in claim 6 further including transmitting the encoded data.

9. (Original) A method as recited in claim 6 further including transmitting the encoded data across multiple conductors, wherein each conductor supports four different signal levels.

10. (Original) A method as recited in claim 6 wherein the data element is a byte of data.

11. (Original) A method as recited in claim 6 wherein encoding the data element includes incrementing each symbol of the data element.

12. (Original) A method as recited in claim 6 wherein encoding the data element includes repeatedly incrementing all bits of the data element until the signal current required to transmit the data element is within the predetermined range of current values.

13. (Original) One or more computer readable media storing computer-executable instructions that, when executed on one or more processors, perform the method of claim ~~0~~6.

14. (Previously Presented) A method of encoding a set of bits for transmission in a system that

supports at least four discrete signal levels on a transmission medium, the method comprising:

encoding a first group of N bits of the set of bits using a first encoding scheme to generate a first encoded bit set that includes at least N+1 bits, wherein the first encoded bit set has a first weighting corresponding to states of the at least N+1 bits of the first encoded bit set;

encoding a second group of N bits of the set of bits using a second encoding scheme to generate a second encoded bit set that includes at least N+1 bits, wherein the second encoded bit set has a second weighting corresponding to states of the at least N+1 bits of the second encoded bit set;

when a combination of the first weighting and the second weighting is within a predetermined weighting range, combining the first and second bit sets to produce an output symbol set;

when the combination of the first weighting and the second weighting is outside of the predetermined weighting range:

encoding the second group of N bits of the set of bits using a third encoding scheme to generate a third encoded bit set that includes at least N+1 bits, wherein the third encoded bit set has a third weighting that is different from the second weighting; and

combining the first and third encoded bit sets to produce the output symbol set.

15. (Original) A method as recited in claim 14 wherein the set of bits represents four input symbols, wherein each of the input symbols represents a most-significant bit and a least-significant bit, and wherein the output symbol set includes five output symbols, such that each of the output symbols represent two bits.

16. (Original) A method as recited in claim 15 wherein the first group of bits includes the most-significant bits of the input symbols and the second group of bits includes the least-significant bits of the input symbols.

17. (Original) A method as recited in claim 14 wherein:

the first weighting is determined based on a number of binary ones included in the first encoded bit set multiplied by a first variable;

the second weighting is determined based on a number of binary ones included in the second encoded set multiplied by a second variable; and

the third weighting is determined based on a number of binary ones included in the third encoded set multiplied by the second variable.

18. (Original) A method as recited in claim 17 wherein the predetermined weighting range spans a range equal to a value of the second variable.

19. (Original) A method as recited in claim 14 wherein the first encoding scheme is such that the first bit set includes either a first number of binary ones or a second number of binary ones, wherein when the first encoded bit set includes the second number of ones, the combination of the first and second encoded bit sets is outside of the predetermined weighting range.

20. (Original) A method as recited in claim 14 wherein when the second group of N bits contains all binary zeros, a first exception bit set is generated, wherein the output symbol set is produced by combining the first exception bit set with the first encoded bit set, wherein the output symbol set has a weighting that is within the predetermined weighting

range.

21. (Original) A method as recited in claim 20 wherein, for all cases other than the case where the second group of N bits is all zeros, the second encoded bit set for a corresponding second group of N bits is the bit-wise inverse of the third encoded bit set for the corresponding second group of N bits.

22. (Original) A method as recited in claim 20 wherein when the first and second groups of N bits both contain all zeros, a second exception bit set is generated as the first encoded bit set and a fourth encoded bit set is generated, wherein the second exception bit set and the fourth encoded bit set are combined to produce the output symbol set, wherein the fourth encoded bit set is generated such that weighting of the output symbol set is within the predetermined weighting range.

23. (Original) A method as recited in claim 14 further comprising transmitting symbols in the output symbol set in parallel over a plurality of lines.

24. (Original) A method as recited in claim 23 wherein each line of the plurality of lines is a communication medium that supports the at least four signal levels.

25. (Original) A method as recited in claim 14 further comprising:

serializing at least a portion of the symbols of the output symbol set to produce a serial stream of symbols; and

serially transmitting the serial stream of symbols over a line.

26. (Original) A method as recited in claim 25 wherein the line is a communication medium

that supports the at least four discrete signal levels.

27. (Original) A method as recited in claim 14 wherein the system supports at least eight discrete signal levels on the transmission medium, wherein the set of bits represents a first number of input symbols, wherein each of the input symbols represents three bits, and wherein each symbol in the output symbol set represents three bits.

28. (Original) A method as recited in claim 14 wherein the system supports at least M discrete signal levels on the transmission medium, wherein the set of bits represents a first number of input symbols, wherein each of the input symbols represents $\log_2 M$ bits, and wherein each symbol in the output symbol set represents $\log_2 M$ bits.

29. (Original) A method comprising:

receiving a data value to be transmitted across a plurality of conductors using current mode drivers, wherein each of the plurality of conductors supports multiple signal levels;

determining whether a sum of the currents required to transmit the data value is within a predetermined range of current values;

transmitting the data value if the sum of the currents is within the predetermined range of current values; and

encoding the data and transmitting the encoded data if the sum of the currents is not within the predetermined range of current values, wherein the data is encoded such that the sum of the currents is within the predetermined range of current values.

30. (Original) A method as recited in claim 29 wherein the predetermined range of values

reduces current changes between successive data values.

31. (Original) A method as recited in claim 29 wherein the received data value is a byte of data.

32. (Original) A method as recited in claim 29 wherein encoding the data value includes incrementing each symbol of the data value.

33. (Original) A method as recited in claim 29 wherein encoding the data value includes incrementing all bits of the data value until the current required to transmit the signal is within the predetermined range of current values.

34. (Original) A method of decoding a set of bits in a system that is capable of receiving at least four discrete signal levels on a transmission medium, the method comprising:

decoding a first group of bits using a first decoding scheme to generate a first decoded group of bits;

decoding a second group of bits using a second decoding scheme to generate a second decoded group of bits;

analyzing the first group of bits to determine whether the first group of bits represents a first exception bit set or a second exception bit set;

if the first group of bits represents a first exception bit set, then replacing the first decoded group of bits with the second decoded group of bits and replacing the second decoded group of bits with a first predetermined value; and

if the first group of bits represents a second exception bit set, then replacing the first decoded group of bits with a second predetermined value and replacing the second

decoded group of bits with the first predetermined value.

35. (Original) A method as recited in claim 34 wherein the bits of the first predetermined value are all zeros and the bits of the second predetermined value are all zeros.

36. (Original) A method as recited in claim 34 further comprising deserializing a serial stream of symbols to identify the first group of bits and the second group of bits.

37. (Previously Presented) An apparatus comprising:

a plurality of multi-level output drivers coupled to a plurality of conductors, each of the multi-level output drivers to output a signal representative of more than a single binary bit onto a respective one of the conductors; and

an encoder configured to receive a data element, the encoder having outputs coupled to the plurality of multi-level output drivers, the encoder encoding the data element, if necessary, to maintain the signal current required to transmit the data element within a predetermined range of values.

38. (Original) An apparatus as recited in claim 37 wherein the encoder further adds a symbol to the data element to indicate any encoding of the data element.

39. (Original) An apparatus as recited in claim 37 wherein the plurality of conductors form a transmission channel.

40. (Original) An apparatus as recited in claim 37 wherein the encoder encodes the data element by incrementing each symbol of the data element.

41. (Original) An apparatus as recited in claim 37 further including transmitting the encoded data element across the plurality of conductors.

42. (Original) An apparatus as recited in claim 37 wherein the plurality of multi-level output drivers are multi-level current drivers.

43. (Original) An apparatus as recited in claim 37 further including a decoder coupled to the encoder, wherein the decoder decodes the signal received from the plurality of multi-level output drivers.

44. (Previously Presented) An apparatus to encode a set of bits for transmission in a system that supports at least four discrete signal levels on a transmission medium, the apparatus comprising:

a first encoder configured to encode a first group of N bits of the set of bits using a first encoding scheme, wherein the first encoder generates a first encoded bit set that includes at least N+1 bits, wherein the first encoded bit set has a first weighting corresponding to states of the at least N+1 bits of the first encoded bit set;

a second encoder configured to encode a second group of N bits of the set of bits using a second encoding scheme, wherein the second encoder generates a second encoded bit set that includes at least N+1 bits, wherein the second encoded bit set has a second weighting corresponding to states of the at least N+1 bits of the second encoded bit set;

a first comparator coupled to the first encoder and configured to determine whether the first weighting has a first predetermined value; and

a second comparator coupled to the second encoder and configured to determine whether

the second weighting has a second predetermined value.

45. (Original) An apparatus as recited in claim 44 further comprising a logic gate coupled to the first comparator and the second comparator such that the logic gate determines whether the first weighting has the first predetermined value.

46. (Original) An apparatus as recited in claim 45 wherein the logic gate further determines whether the second weighting has the second predetermined value.

47. (Original) An apparatus to decode a set of bits received by a system, the apparatus comprising:

a first decoder configured to decode a first group of bits using a first decoding scheme, wherein the first decoder generates a first decoded group of bits;

a second decoder configured to decode a second group of bits using a second decoding scheme, wherein the second decoder generates a second decoded group of bits;

a first comparator coupled to the first decoder and configured to determine whether the first group of bits represents a first exception bit set;

if the first group of bits represents the first exception bit set, then the first decoded group of bits is replaced with the second decoded group of bits and the second decoded group of bits is replaced with a first predetermined value;

a second comparator coupled to the first decoder and coupled to determine whether the first group of bits represents a second exception bit set; and

if the second group of bits represents the second exception bit set, then the first decoded group of bits is replaced with a second predetermined value and the second decoded group of bits is replaced with the first predetermined value.

48. (Original) An apparatus as recited in claim 47 wherein the bits of the first predetermined value are all zeros and the bits of the second predetermined value are all zeros.

49. (Original) An apparatus as recited in claim 47 further comprising a deserializer coupled to the first decoder and the second decoder, wherein the deserializer is configured to deserialize a serial stream of symbols.